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(54) Title: IMPROVED METHOD FOR THE PREVENTION OR REDUCTION OF HAZE IN BEVERAGES

(57) Abstract: The invention relates to a method for the prevention or reduction of haze in a beverage by the addition of a prolyl-specific and/or alamine specific endoprotease and the new beverages obtainable by the method according to the invention. It also relates to new endoproteases. It also relates to methods as described above wherein auxiliary enzymes are used in combination with the specific endoprotease. Sequence information of a genomic DNA, cDNA as well as protein sequences are provided.



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INTERNATIONAL SEARCH REPORT

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, FSTA, BIOSIS, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 02 46381 A (LOPEZ MICHEL ;EDENS LUPPO (NL); DSM NV (NL)) 13 June 2002 (2002-06-13) claims	1-16, 23-30
X	US 4 532 213 A (SHETTY JAYARAMA K ET AL) 30 July 1985 (1985-07-30)	1,2, 4-10,14, 23-28
A	column 1, paragraph 1; claims 1-3	3,11-13, 15-22

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Section Ch, Week 197850 Derwent Publications Ltd., London, GB; Class D16, AN 1978-90438A XP002216998 & JP 53 127896 A (ASAHI BREWERIES LTD), 8 November 1978 (1978-11-08) abstract -----	1-10, 14, 15, 23-28
X	US 5 192 677 A (KINSELLA JOHN E ET AL) 9 March 1993 (1993-03-09) abstract column 5, paragraph 5 -----	27-30
X	EP 0 522 428 A (VANDEMOORTELE INT NV) 13 January 1993 (1993-01-13) cited in the application claims 1, 6, 7 -----	23, 24
X A	US 5 035 902 A (BILINSKI CARL ET AL) 30 July 1991 (1991-07-30) example -----	27, 28 1-26, 29, 30

INTERNATIONAL SEARCH REPORT

Intern I Application No
PCT/WL 0352

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0246381	A	13-06-2002	AU 1608902 A	18-06-2002
			AU 1970902 A	18-06-2002
			AU 3456102 A	18-06-2002
			WO 0245523 A2	13-06-2002
			WO 0245524 A2	13-06-2002
			EP 1326957 A2	16-07-2003
			WO 0246381 A2	13-06-2002
			WO 02068623 A2	06-09-2002
US 4532213	A	30-07-1985	DE 3479813 D1	26-10-1989
			DK 587784 A	09-06-1985
			EP 0146022 A2	26-06-1985
			MX 7673 E	16-07-1990
JP 53127896	A	08-11-1978	JP 1067424 C	23-10-1981
			JP 56009913 B	04-03-1981
			US 4181742 A	01-01-1980
US 5192677	A	09-03-1993	NONE	
EP 0522428	A	13-01-1993	JP 6014776 A	25-01-1994
			EP 0522428 A1	13-01-1993
US 5035902	A	30-07-1991	NONE	